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EXAMINER

CHOW, JEFFREY J

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/688,063

**Applicant(s)**

WONG ET AL.

**Examiner**

Jeffrey J. Chow

**Art Unit**

2628

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 and 31-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-15 and 31-34 is/are allowed.
- 6) ☒ Claim(s) 16-25 and 35 is/are rejected.
- 7) ☒ Claim(s) 26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/808)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments regarding claims 1 – 15 and 31 – 34, filed 01 December 2008, have been fully considered and are persuasive. The previous ground of rejections has been withdrawn.

Applicant's arguments regarding claims 16 – 26 and 35, filed 01 December 2008, have been fully considered but they are not persuasive.

Applicant argues it would not be obvious to replace Hutson's (US 5,175,710) decomposition with Haar wavelet decomposition as taught by Chakrabarti et al. (US 6,760,724) with the reasons singular value decomposition (SVD) is essential to the proper function of Hutson's system, and substituting wavelet decomposition for Hutson's SVD would fundamentally alter the principal of operation of Hutson and/or render the Hutson algorithm unsuitable for its intended purpose and therefore teaches away from replacing SVD method (pages 12 and 13). Hutson discloses the BTR data is analyzed by Singular value Decomposition (SVD), or in an alternative embodiment, through Eigenvector Decomposition (EVD) (column 10, lines 51 - 53). Hutson does not teach away from replacing SVD method and therefore it would have been obvious to modify Hutson's system to use other decomposition methods.

Applicant argues SVD analysis in Hutson is not a multi-dimensional scaling routing (page 13). Hutson discloses the singular values D (62) are displayed in a diagonal form and represent the weights used to adjust the singular vectors and the input data is post-multiplied by the right singular vectors to enhance the input data and enhance the input data by pre-multiplying

the input data by the left singular vectors (column 6, lines 27 – 40). The weights are used to enhance the input data and therefore Hutson teaches multi-dimensional scaling routine.

Applicant argues Hutson does not teach vector dimension reduction or the process of selecting a subset of the data stream for evaluation and processing (pages 13). The claimed limitation recites, “performing **at least one of** vector sampling and vector dimension reduction on a group of data vectors to provide a data set with a reduced number of data elements relative to the group of the data vectors” (emphasis added). Hutson discloses matrix analysis through the use of eigenvectors and eigenvalues apply to singular value decomposition, as singular values are the square root of eigenvalues and singular vectors are equivalent to eigenvectors (column 5, lines 60 – 67) and therefore teaches the claimed limitation. Hutson also discloses the three-dimensional matrix is reformatted by first separating it into a series of two-dimensional matrices and the concatenating the two-dimensional matrices together along a common dimension (column 9, lines 23 – 45). Once the three-dimensional data is reduced to a series of two-dimensional matrices, the SVD routine can be performed on each two-dimensional matrix (column 10, lines 49 – 57). Examiner believes the cited portions of Hutson reads on both “vector sampling” and “vector dimension reduction” portions of the claimed limitation.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 21, 23, 24, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Hutson (US 5,175,710).

Regarding independent claim 21, Hutson teaches a method, comprising  
receiving a data stream (column 5, lines 14 – 23: the amplitude and bearing of the received signal to a grayscale format, or a “bearing time record” (BTR)),  
processing a stream of data vectors corresponding to the data stream (column 5, lines 60 – 67: matrix analysis through the use of eigenvectors and eigenvalues apply to singular value decomposition, as singular values are the square root of eigenvalues and singular vectors are equivalent to eigenvectors),

visualizing at least a portion of the data stream (Figure 6: shows the output display of a BTR image 70) by executing a multidimensional scaling routine with at least a corresponding portion of the data vectors (column 6, lines 27 – 40: the singular values D (62) are displayed in a diagonal form and represent the weights used to adjust the singular vectors and the input data is post-multiplied by the right singular vectors to enhance the input data and enhance the input data by pre-multiplying the input data by the left singular vectors), and

with a computer (column 1, lines 7 – 12: a data processing system), performing at least one of vector sampling and vector dimension reduction on a group of the data vectors to provide a data set with a reduced number of data elements relative to the group of the data vectors (column 5, lines 60 – 67: matrix analysis through the use of eigenvectors and eigenvalues apply to singular value decomposition, as singular values are the square root of eigenvalues and singular vectors are equivalent to eigenvectors; column 6, lines 7 - 21: the matrix can be

decomposed using numerical math pertaining to singular values and singular vectors; column 6, lines 41 – 50: data is compressed by 82%, allowing data to be displayed).

Regarding dependent claim 23, Hutson teaches the data stream includes at least one of a number of text documents and a number of images (column 1, lines 49 – 57: digital image can be formed from a variety of input data signals, including seismic, radar, radio, video and film).

Regarding dependent claim 24, Hutson teaches generating a visualization with the data set (Figure 6: shows the output display of a BTR image 70).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 16, 17, 19, 20, 22, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hutson (US 5,175,710) in view of Chakrabarti et al. (US 6,760,724).

Regarding independent claim 16, Hutson teaches a method, comprising receiving a data stream (column 5, lines 14 – 23: the amplitude and bearing of the received signal to a grayscale format, or a “bearing time record” (BTR)),

processing a group of data vectors corresponding to the data stream (Figure 6: shows the output display of a BTR image 70).

Hutson did not expressly disclose generating a reduced data set which includes reducing dimension of the data vectors with wavelet decomposition, and with a computer, providing a representation with the reduced data set corresponding to a visualization of a portion of the data stream, however Hutson discloses a data processing system (column 1, lines 7 – 12) and a matrix analysis through the use of eigenvectors and eigenvalues apply to singular value decomposition, as singular values are the square root of eigenvalues and singular vectors are equivalent to eigenvectors (column 5, lines 60 – 67) and data is compressed by 82%, allowing data to be displayed (column 6, lines 41 – 50). Chakrabarti discloses Haar wavelet decomposition (column 3, line 66 – column 4, line 13). It would have been obvious for one of ordinary skill in the art at the time of the invention to replace Hutson’s decomposition with Haar wavelet decomposition method for sampling input data and reducing the dimension of the input data with the Haar wavelet decomposition method. One would be motivated to do so because wavelet decomposition method can be used to effectively generate compact representations that exploit

the structure of data and Haar wavelets are conceptually simple, very fast to compute, and perform well in a variety of applications.

Regarding dependent claim 17, Hutson teaches visualizing a part of the data stream in accordance with a multidimensional scaling routine (column 6, lines 27 – 40; singular vectors and/or singular values are used by the real-time multi-dimensional processing system as a filter to enhance and/or suppress features within the BTR data).

Regarding dependent claim 19, Hutson teaches the data stream corresponds to at least one of a number of text documents and a number of images (column 1, lines 49 – 57: digital image can be formed from a variety of input data signals, including seismic, radar, radio, video and film).

Regarding dependent claim 20, Hutson did not expressly disclose generating includes performing the wavelet decomposition with Haar wavelets. Chakrabarti discloses Haar wavelet decomposition (column 3, line 66 – column 4, line 13). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hutson's system to incorporate Haar wavelet decomposition method for sampling input data and reducing the dimension of the input data with the Haar wavelet decomposition method. One would be motivated to do so because Haar wavelet decomposition method is conceptually simple and very fast to compute.



Regarding dependent claim 22, Hutson did not expressly disclose the dimension reduction routine includes wavelet decomposition. Chakrabarti discloses Haar wavelet decomposition (column 3, line 66 – column 4, line 13). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hutson's system to incorporate Haar wavelet decomposition method for sampling input data and reducing the dimension of the input data with the Haar wavelet decomposition method. One would be motivated to do so because Haar wavelet decomposition method is conceptually simple and very fast to compute.

Regarding independent claim 35, claim 35 is similar in scope as to claim 16, thus the rejection for claim 16 hereinabove is applicable to claim 35.

Claims 18 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hutson (US 5,175,710) in view of Deerwester et al. ("Indexing by Latent Semantic Analysis").

Regarding dependent claims 18 and 25, Hutson did not expressly disclose performing a similarity analysis with the representation. Deerwester discloses indexing and retrieval documents (abstract) and a document matrix that contain the frequency of which a term occurs in a document (pg. 10: Table 2). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Hutson's system to take in document related inputs and to utilize a document matrix to obtain a frequency certain terms occur in a document. One would be motivated to do so because this would improve the detection of relevant documents on the basis of terms found in queries

***Allowable Subject Matter***

Claim 26 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 1 – 15 and 31 – 34 are allowed.

The following is an examiner's statement of reasons for allowance: the limitations, "projecting each member of the second group of the data vectors onto the visualization as a function of the first set of values", wherein "the first set of values corresponding to one or more eigenvectors for a matrix define with the first group of the data vectors", wherein "the stream of data vectors comprising a first group of data vectors and a second group of data vectors corresponding to different portions of the stream of data vectors" are not well known or rendered obvious by the cited prior arts.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey J. Chow whose telephone number is (571)-272-8078. The examiner can normally be reached on Monday - Friday 10:00AM - 5:00PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on (571)-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JJC

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/Kee M Tung/

Supervisory Patent Examiner, Art Unit 2628